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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/057,025 | 01/24/2002 | Chen-Kuei Chung | 64,600-019 | 2074 |

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EXAMINER

BROOKE, MICHAEL S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 06/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,025

Applicant(s)

CHUNG ET AL.

Examiner

Michael S. Brooke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 03 March 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II in Paper No. 3 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. On 11/26/02, the examiner contacted the Applicant's representative and informed him that the reply filed on 11/08/02 was incomplete, in that it did not address the election of species. Applicant's then elected to prosecute species 1, as shown in Figs. 1A-1N and 2A-2E.
3. Claims 1-10 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 3.

Drawings

4. The corrected or substitute drawings were received on 03/03/03. These drawings are acceptable.

Claim Objections

5. Claim 11 is objected to because of the following informalities: This claim recites a first and third insulating layer, but it does not recite a second insulating layer.

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Accordingly, the "third insulating layer" should be changed to the "second insulating layer." Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramaswami et al (6,267,471) in view of Abe et al. (4,914,562), Figueredo et al. (6,155,674), Taub et al. (5,308,442) and Hawkins et al. (6,214,245).

Ramaswami et al. teaches (Fig. 4) a prior art ink jet print head comprising:

- A silicon substrate (202).
- A first insulating material layer that is made of silicon dioxide and which has a thickness of 10,000-24,000 angstroms (col. 28:49-67 and col. 29:1-7).
- Electrical interconnects (22), that are connected to a heater (210).
- A third insulating layer (230), that is formed on top of the heater.
- A photoresist layer (260), that is formed on top of the first insulating layer and which has a thickness of 50,000-300,000 angstroms (col. 35:1-48).
- An ink chamber (264), that is formed in the photoresist layer and is in communication with an ink manifold.

Ramaswami et al. teaches the claimed invention, with the exception of a ring shaped heater, a funnel shaped manifold in the substrate, a metal seed layer on the first photoresistive layer, a nickel layer on top of the metal seed layer, the heater in the primary ink chamber being ring-shaped and the seed layer being either Ni or Cr.

Abe et al. teaches an ink jet print head comprising a ring shaped heater (Fig. 17(c)). A ring shaped heater provides the advantage of reducing cavitation damage, by allowing the shock wave generated by the collapse of the bubble to pass through the heater (col. 14:25-40). It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Ramaswami et al. with a ring shaped heater, in order to reduce cavitation damage, as taught by Abe et al.

The ink flow passage disclosed by the prior art of Ramaswami et al. is of the edge feed type, wherein ink flow from the side of the substrate. Figueredo et al. teaches that an edge feed type ink flow manifold and a center feed type ink manifold (where the ink is provided through an opening in the substrate) are art recognized equivalents (see Fig. 1 and 1A) for the purpose of supplying ink. Since these different types of ink manifolds were art recognized equivalents at the time the invention was made, one of ordinary skill in the ink jet art would have found it obvious to have substituted a center feed type ink manifold for the edge feed ink manifold of Ramaswami et al., in order to supply ink in a known alternative manner.

Taub et al. teaches an ink jet print head having funnel shaped ink manifold formed therein. The use of a funnel shaped manifold provides increased flow capacity to adequately respond to ink volume demands (col. 1:56-59). It would have been

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obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Ramaswami et al., as modified by Figueredo et al., with a funnel shaped manifold for the purpose of adequately responding to ink volume demands, as taught by Taub et al.

Hawkins et al. teaches a method of forming an orifice plate for an ink jet print head wherein a Ni or Cr seed layer (444) is formed over a substrate and then a plate layer of nickel (446) is deposited over the seed layer, so that the seed layer and the plate layer form a nozzle plate (445) (col. 8:52-65). The use of the seed layer allows for the production of very small or critically dimensioned nozzle plates which are thin and flexible (col. 8:27-30). It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made, to have provided Ramaswami et al. with a metal seed layer on the first photoresistive layer, a nickel layer on top of the metal seed layer, for the purpose of making a nozzle plate that is very small or critically dimensioned and which is thin and flexible, as taught by Hawkins et al.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael S. Brooke whose telephone number is 703-305-0262. The examiner can normally be reached on M-F 5:30-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russell E. Adams can be reached on 308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

Michael S. Brooke
Examiner
Art Unit 2853

MSB
MSB
June 9, 2003

Judy Nguyen
JUDY NGUYEN
PRIMARY EXAMINER